

Embedding Data Information Literacy into Software Design Projects

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As a part of the Data Information Literacy (DIL) Project (<http://datainfolit.org>) the authors sought to explore how the 12 DIL competencies could be connected and applied to software code as a specialized type of data.



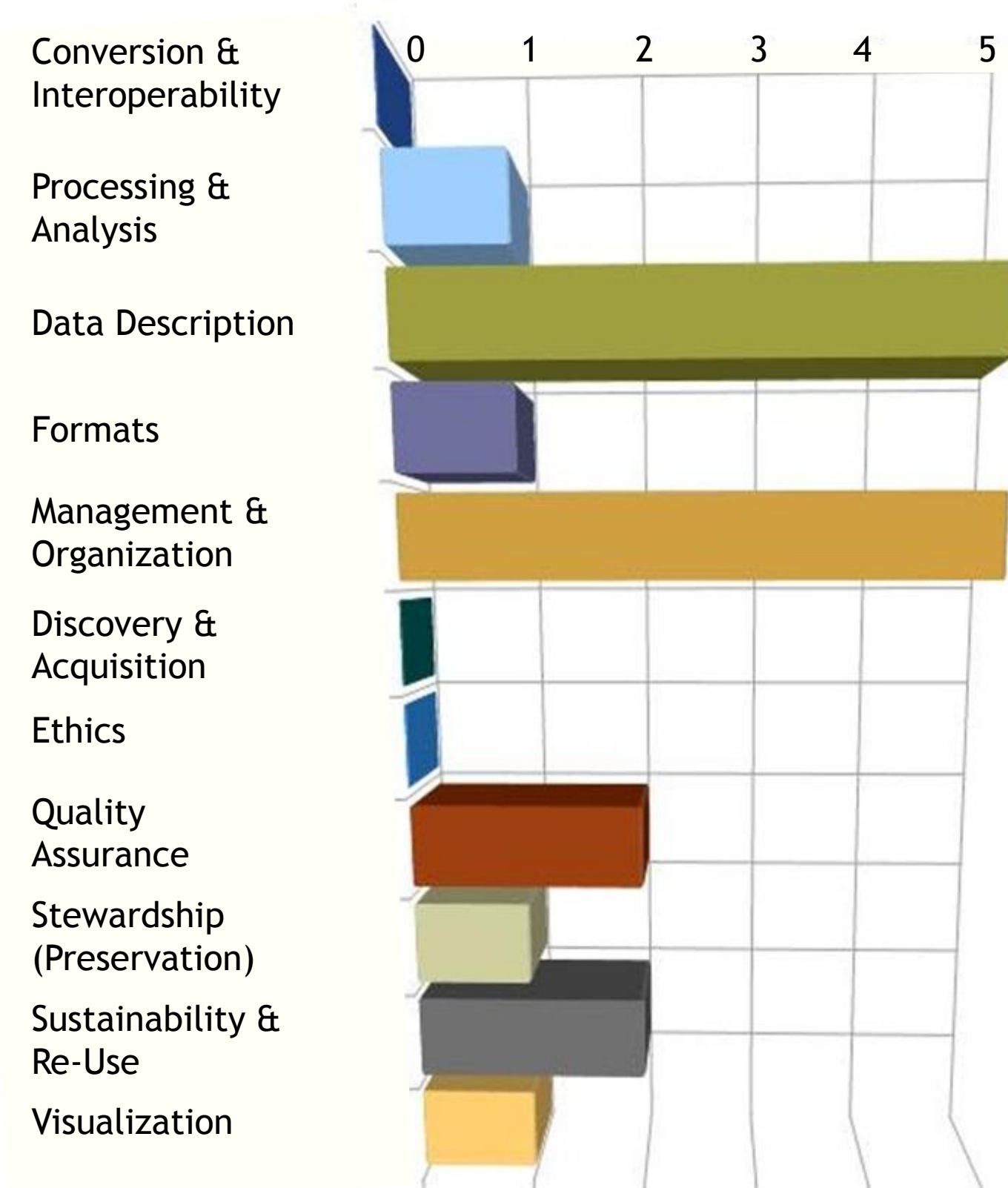
Our project partner was Engineering Projects in Community Service (EPICS), a service learning center at Purdue focused on teaching undergraduates engineering design concepts and skills while working with community service agencies to develop customized engineering solutions to address agency needs.

Proposed Intervention

Investigators propose to address student achievement gaps in data skills by:

- Creating educational materials that work in tandem with existing course materials
 - Rubric
 - Data management activities across design lifecycle
- Training graduate TAs about data management so they could grade student submissions of documentation
- Educating design team on data management skills via presentation/skill session/mentoring
- Holding students accountable for data management decisions
 - Design Reviewers

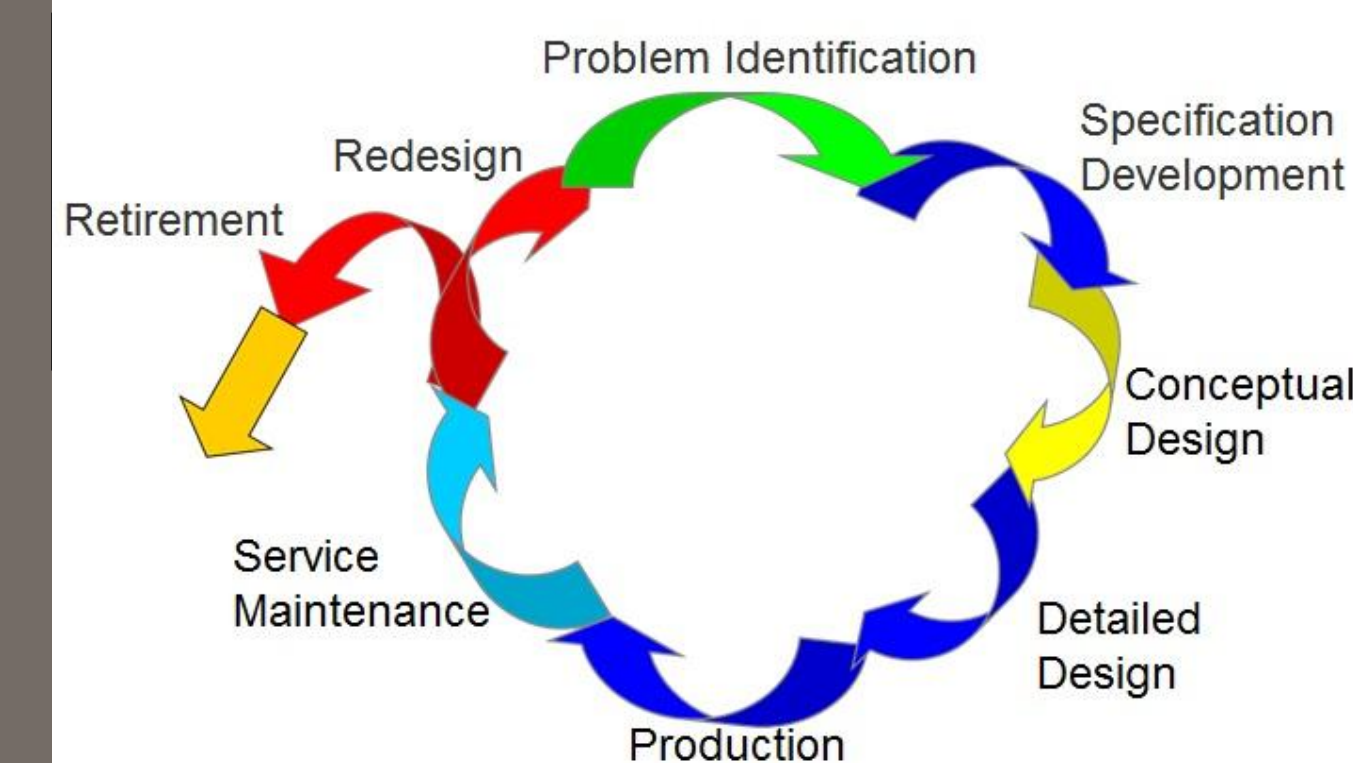
Competencies Identified as Important to EPICS Curriculum



We conducted interviews with faculty and graduate students in Engineering and Computer Science to understand how the DIL Competencies related to their work.

To better understand the needs of EPICS we coded the interviews we conducted with EPICS personnel according to the number of instances where the DIL competencies were mentioned in the context of the EPICS Curriculum. The results of our coding are shown in the chart to the left.

The Design Lifecycle



The design lifecycle is a guiding model for all EPICS curricula. As such, we chose to integrate our data management solutions with the design lifecycle. Identifying data management

tools that made sense within the design tasks performed at each stage of the design lifecycle gave students an intuitive way to implement data management while simultaneously understanding that data management was an integral part of the design task, not an annoying extra task.

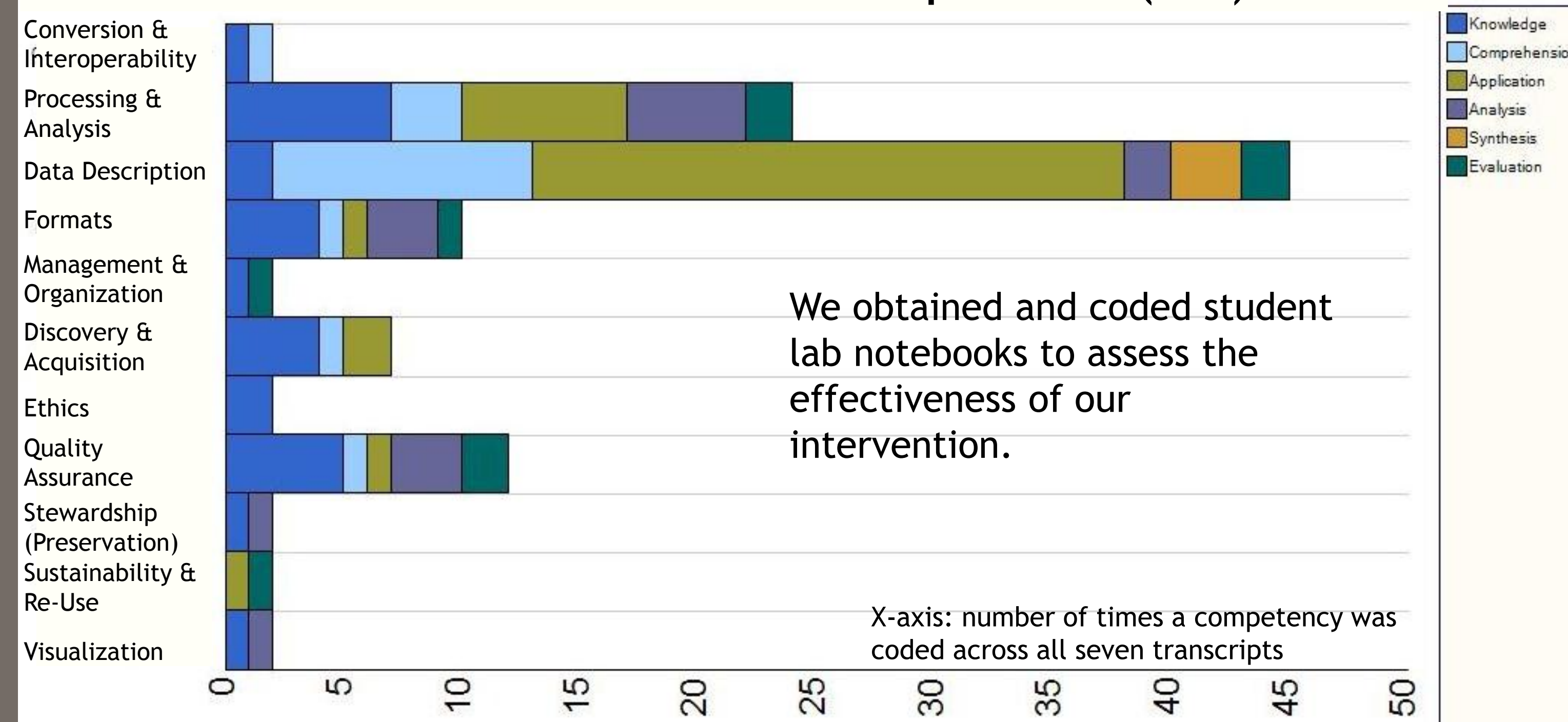
Conclusion

We concluded that while the interventions that we created had some notable impact on student demonstrations within their lab notebooks, a more structured attempt to integrate data management skills within the team is needed to successfully create quality documentation at the project wide level.

Next Steps: Introduce the “Project Archivist” Role

- Officer on the team
- Responsible for coordinating the design documentation for entire team
- Team members report to project archivist:
 - what decisions were made,
 - why those decisions were made,
 - how the changes were implemented and
 - where the changes are documented
- Provides broad context for entire project, ensuring smooth transitions and delivery.

Student Demonstration of DIL Competencies (n=7)



We obtained and coded student lab notebooks to assess the effectiveness of our intervention.

X-axis: number of times a competency was coded across all seven transcripts